

WHAT IS CLAIMED IS:

1. A multi-mode bi-directional communications device, comprising
 - a diplexer including a high-pass filter, a first low-pass filter, and a second low-pass filter;
 - 5 downstream processing circuitry coupled to the high-pass filter; and
 - upstream processing circuitry selectively coupled to the first low-pass filter and the second low-pass filter.
2. The device of claim 1, wherein the downstream processing circuitry comprises:
 - 10 a tuner;
 - a demodulator;
 - a first SAW filter selectively coupled between said tuner and said demodulator;
 - and
 - a second SAW filter selectively coupled between said tuner and said
 - 15 demodulator.
3. The device of claim 2 wherein the first SAW filter has a bandwidth of 6MHz and the second SAW filter has a bandwidth of 8MHz.
- 20 4. The device of claim 2 further comprising at least one first selector for selectively coupling the first SAW filter and the second SAW filter between the tuner and the demodulator.
5. The device of claim 1 wherein said high-pass filter passes signals greater than
 - 25 88MHz.
6. The device of claim 1 wherein the first low-pass filter passes signals less than 65MHz and the second low-pass filter passes signals less than 42MHz.
- 30 7. The device of claim 1 further comprising at least one second selector for selectively coupling the first low-pass filter and the second low-pass filter to the upstream processing circuitry.

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8. The device of claim 1, wherein said device is a cable modem.
9. The device of claim 1, wherein said device supports multiple standards selected from
5 the group consisting of the North American Data Over Cable Service Interface
Specifications (DOCSIS) or the European DOCSIS standards.
10. A diplexer, comprising;
a high-pass filter coupled between a first signal port and a second signal port;
10 a first low-pass filter coupled between said first signal port and a third signal
port; and
a second low-pass filter coupled between said first signal port and said third
signal port.
- 15 11. The diplexer of claim 10, further comprising at least one selector for selectively
coupling at least the first low-pass filter or the second low-pass filter between said first
and third signal ports.
- 20 12. The diplexer of claim 11, wherein the at least one selector comprises a switch
selected from the group consisting of transistors, diodes, electro-mechanical and
mechanical switches.
13. The diplexer of claim 10, wherein each of said first and second low-pass filters
comprise:
25 a plurality of inductors connected in series between said first and third signal
ports, each of said inductors being coupled to ground via a respective capacitor forming
thereby a plurality of single pole filter elements, a portion of said inductors being
bypassed by respective capacitors.

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14. The diplexer of claim 10, wherein said high-pass filter comprises:

a plurality of capacitors connected in series between said first and second signal ports, each of said capacitors being coupled to ground via serially coupled circuit elements forming thereby a plurality of single pole filter elements, each of said serially
5 coupled circuit elements comprising a capacitor and inductor.

15. A method of passing bi-directional communications signals of differing modes through a diplexer having a high-pass filter coupled between a first and a second signal port, a first and a second low-pass filter selectively coupled between the first and a third
10 signal port, comprising:

receiving downstream signals at the first signal port;
filtering the received downstream signals using said high-pass filter;
communicating filtered downstream signals to the second signal port;
receiving upstream signals at the third signal port;
15 selecting one of the first or second low-pass filters for filtering said received upstream signals in response to a desired communications mode; and
sending the filtered signals to the first signal port.

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